

PROGRESS OF MEDICAL SCIENCE

MEDICINE

UNDER THE CHARGE OF

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The Nature of Arthritis and Rheumatoid Conditions.—PEMBERTON *Jour. Am. Med. Assn.*, December 25, 1920, lxxv, 1759-1764). In this report the author offers a working hypothesis of this disease, based on recent reseaches of others and an extensive investigation carried out by him while in government service. He notes that while the importance of focal infection was abundantly illustrated in his cases (young men) still the subjects of the study showed a considerable independence of it. The important role played by exposure and wet alone suggests that focal infection is not the only etiological factor. It may, however, serve as a precipitating factor in these cases. It is noted that agents which hasten metabolism as a whole may have a decidedly beneficial effect on arthritis (x-ray, radium, thyroid extract, muscular exercise, psychic disturbances). Moreover, there is in arthritis a difficulty in the utilization of food as indicated by the therapeutic effect of lowered diet and by the frequent presence in these cases of a lowered sugar tolerance. The latter is interpreted as evidence of disturbance of some of the oxidative and combustive processes of the body. Ingestion of carbohydrate in large amounts is sometimes harmful in arthritis. Conversely, the fact that arthritis rarely occurs in diabetes is noted. The fact that rheumatoid conditions occur chiefly in joints and muscles is noted and a partial explanation is offered in that in the joints, on account of their poor blood supply, oxidative metabolism is sluggish, and in the muscles takes place an important part of the metabolism of sugar, one substance known to stand in some relation to the disease. Factors affecting oxidative function are discussed (areas of varying CO₂ tension in the circulating blood; temperature of the blood at a

given point; barometric pressure; factors making for acidosis, etc.). Once the relation of the oxidative functions of the blood to arthritis has been established, these considerations will find application. The author feels that rheumatic and arthritic phenomena find their chief explanation on these principles, and offers the following working hypothesis of the disease: There is a lowered respiratory or metabolic capacity possibly in the circulating blood. This is able to achieve a certain amount of its normal function but not all; those sites therefore at which metabolism is normally most sluggish (joints) are first to suffer. Hyperemia of a part involved often suffices to restore metabolic conditions locally, but does not necessarily relieve the general situation. Thus the disturbance may pass rapidly from one joint to another. That reduction of temperature lowers the dissociation curve of hemoglobins for oxygen is offered as a possible explanation of myositis and arthritis due to exposure. The beneficial effect of heat in arthritis may be explained by the raising of the dissociation curve together with the local hyperemia produced. The author feels that it is reasonable to believe that many factors as many types of infection, exposure to wet or cold, chronic intestinal conditions, possibly interglandular disturbances may induce the substratum, partly illustrated by a lowered sugar tolerance, which is shown to accompany this disease so closely. The paper is concluded with a discussion, along general lines, of treatment.

Failure of Antibody Formation in Leukemia.—HOWELL (*Arch. Int. Med.*, 1920, xxvi, 706) has made observations upon antibody formation in lymphatic leukemia and in myeloid leukemia with the following results: "Individuals with leukemia who contract typhoid or paratyphoid infection may fail to develop the specific agglutinins in the blood. A similar failure of agglutinin formation also occurs when a leukemic individual is injected with typhoid vaccine in a dosage which causes agglutinin formation in a normal control. Opsonins are also absent in the blood after injection with typhoid vaccine. The failure of both opsonin and agglutinin formation after typhoid vaccination, as shown in the 2 cases reported here, of agglutinin formation in Moreschi's spontaneously infected cases and in his vaccinated cases, and of agglutinin production after vaccination with still another bacterial species, as shown by Rotky, may indicate that the tissues of the leukemic individual have lost the property of antibody formation in general. The loss of ability to form antibodies is probably the result of the marked alterations in the hematopoietic tissues which characterize leukemia. This loss of ability may be due to the excessive proliferation of the hematopoietic tissues, one of whose normal functions is the formation of antibodies. With rapidly repeated cell generations the cellular energy used in multiplication prevents the utilization of the energy which is necessary for normal function. The temperature reaction after bacterial vaccination in leukemia is variable. When a rise in temperature occurs it may not be associated with antibody production. The leukocytic reaction after vaccination is also variable. Some cases react like normals with an increase in the number of circulating leukocytes. Others show no changes. In still others a decrease may occur. The variable leukocytic reaction, like the failure of antibody formation, is probably the result of the alterations in the hematopoietic tissues."